

1. (Twice Amended) A method for enabling a first consumer device that is able to communicate only with local devices to access services of a remote second device, comprising the steps of:

enabling establishment of a link between the first consumer device and the remote second device via multiple intermediate servers, by

establishing a first communicative connection between the first consumer device and a first intermediate server that is local to the first consumer device; and

establishing a second communicative connection between the first intermediate server and a second intermediate server that is remote from the first server and that is local to the second device; and

establishing a third communicative connection between the second intermediate server and the second device,

and wherein the link includes the first, second and third communicative connections, and communications from the first consumer device to the remote second device are forwarded along the link by the first and second intermediate servers in a manner transparent to the first consumer device;

under control of the first consumer device,

requesting from the first intermediate server a listing of services available via the first intermediate server;

receiving from the first intermediate server a listing of multiple available services; and

after receiving the listing of multiple available services, requesting from the first intermediate server one of the multiple available services, the requested service available to be provided by the remote second device; and

after the first intermediate server forwards an indication of the requested service to the remote second device via the established link, performing the requested service at the remote second device.

2. The method of claim 1 wherein the step of establishing the second communicative connection further comprises the step of verifying that the first device has authorization to establish the second communicative connection.

3. The method of claim 1 further comprising, after the performing step, the step of sending from the second device to the first device the status of the performing step.

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4. (Twice Amended) The method of claim 1 wherein the listing of multiple available services received by the first consumer device from the first intermediate server are services available from the second device.

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5. (Amended) The method of claim 1 wherein the establishing of the first communicative connection comprises the step of establishing a wireless communicative connection between the first consumer device and the first server.

6. (Amended) The method of claim 1 wherein the establishing of the third communicative connection comprises the step of establishing a wireless communicative connection between the second device and the second server.

7. (Twice Amended) An apparatus for accessing services of a remote device via one or more intermediate servers, comprising:

a first module capable of initiating establishment of a first communicative connection to a local intermediate server and of initiating establishment of at least a second communicative connection between the local intermediate server and the remote device; and

a second module capable of receiving from the local intermediate server a listing of multiple services available via the local intermediate server and of requesting from the local intermediate server one of the multiple available services, the requested service available to be performed from the remote device,

so that the remote device will perform the requested service after receiving notification of the request via the first and second communicative connections.

8. (Amended) A server device that is capable of communicating over a first communications link with a client device and over a second network link with a second server device, comprising:

a communications link interface for communicating between the server device and the client device;

a network interface for communicating between the server device and a second server device; and

a processing unit, being operable to send and receive data over the communications link interface and over the network interface, the processing unit being further operable to:

establish a communications link for data communication through the link interface with the client device;

establish a network link for data communication through the network interface to the second server device;

provide information to the client device about available services by, obtaining information from the second server device about services available via the second server device; and

sending to the client device information about available services that includes the obtained information from the second server device; and

facilitate performance of services for the client device by, forwarding service requests from the client device to the second server device for one or more of the available services whose information was obtained from the second server device and sent to the client device; and

forwarding responses to at least some of the service requests from the second server device to the client device.

9. The server device of claim 8 wherein the communications link is a wireless interface.

10. A method for a first client device to access the services supplied by a second client device, comprising the steps of:

establishing a first link between the first client device and a first server;

transmitting a connection command over the first link to the first server, the connection command being operative to request a connection with a second server and comprises an address of the second server, a user identification, and a password;

establishing a second link between the first server and a second server;

transmitting the connection command over the second link from the first server to the second server;

verifying the authorization of the user identification and password at the second server;

notifying the first server over the second link from the second server of the acceptance of the connection command upon success of the verifying step;

notifying the first client device from the first server over the first link of the acceptance of the connection command;

requesting a listing from the first server of available services from the second client device wherein the first server requests such a listing from the second server, the second server maintaining such a listing from the second client device which is communicatively coupled to the second server over a third link, and the listing identifying at least one service offered by the second client device;

the first consumer device requesting a service from the listing to be performed by the second client device by relaying a service request to the second client device;

performing the service requested in the service request by the second client device.

11. (Twice Amended) A first client apparatus for accessing services supplied by a remote second apparatus, comprising:

means for initiating establishment of a first link between the first client apparatus and a local first server;

means for transmitting a connection command over the first link to the local first server, the connection command being operative to request a connection with a remote second server and comprising a user identification, and a password;

means for receiving notification from the local first server over the first link of acceptance of the connection command by the remote second server, the receiving of the acceptance notification after a second link is established between the local first server and the remote second server and after the remote second server verifies authorization of the user identification and password;

means for requesting a listing from the local first server of one or more services available from the remote second apparatus based at least in part on a listing maintained by the remote second server that includes information obtained from the remote second apparatus over a third link communicatively coupling the remote second server to the remote second apparatus;

means for receiving from the local first server the requested listing after the local first server obtains that listing from the remote second server; and

means for requesting a service from the listing to be performed by the remote second apparatus by relaying a service request to the remote second apparatus via the local first server, such that the requested service will be performed by the remote second apparatus.

✓12. Canceled.

✓13. Canceled.

✓14. Canceled.

✓15. Canceled.

16. (Amended) A system for allowing client devices remote from each other to communicate via intermediate server devices, the system comprising:

a local server able to communicatively couple to a client device that is local to the local server, the local client device designed to communicate only with other local client devices, the local server also able to communicatively couple to a remote server, the local server operative to:

receive a request from the local client device for an indicated service to be performed;

provide a request message to the remote server to perform the indicated service;

receive a response message from the remote server, the response message being affiliated with the request message; and

respond to the local client device with information indicative of the response message; and

the remote server able to communicatively couple to the local server and to a remote client device that is local to the remote server, the remote server operative to:

receive the request message from the local server;

perform further processing based on the request message; and

provide the response message to the local server,

so that the local client device can request services that are provided by the remote client device by using the local and remote servers as intermediaries.

17. (Amended) The system of claim 16, wherein the request from the local device comprises a request to establish a logical connection to the remote server and includes an IP network address of the remote server.

18. (Amended) The system of claim 16, wherein the request from the local device comprises a request to establish a logical connection between the local device and the remote server.

19. (Amended) The system of claim 18, wherein the request from the local device further includes a user identification and a password, and the providing of the request message to the remote server and the receiving of the response message from the remote server includes:

establishing a link with the remote server;

transmitting the user identification to the remote server;

receiving a first status indicator from the remote server in response to the user identification;

transmitting the password to the remote server; and

receiving a second status indicator from the remote server in response to the password.

20. The system of claim 19, wherein after establishing a link with the remote server, the local server receives a message from the remote server indicating that the remote server is communicatively compatible with the local device.

21. The system of claim 19, wherein the first status indicator indicates that the user identification is not accepted by the remote server.

22. The system of claim 19, wherein the first status indicator indicates that the user identification is accepted by the remote server.

23. The system of claim 19, wherein the second status indicator indicates that the password provided is valid for the user identification.

24. The system of claim 19, wherein the second status indicator indicates that the password provided is invalid for the user identification.

25. (Amended) The system of claim 19, wherein the responding to the local device with information indicative of the response message includes:

providing a first response if the response message indicates that the logical connection could not be established;

providing a second response if the response message indicates that the user identification and password are not both acceptable by the remote server;

providing a third response if the response message indicates that the logical connection is established; and

providing a fourth response if the response message indicates that a logical connection already exists with another server.

26. (Amended) The system of claim 16, wherein the request message from the local device comprises a request to disconnect a logical connection to the remote server.

27. (Amended) The system of claim 16, wherein the request from the local device comprises a request to disconnect a logical connection between the local device and the remote server, wherein the providing of the request message to the remote server includes transmitting to the remote server a request to disconnect the logical connection between the local device and the remote server, and wherein the receiving of the response message from the remote server includes receiving a status indicator from the remote server indicating that the logical connection is disconnected.

28. (Amended) The system of claim 16, wherein the request from the local device comprises a request for the remote device to provide a service.

29. (Amended) The system of claim 16, wherein the request from the local device comprises a request for the remote server to identify a device type and a service type for at least one remote device that can be communicatively coupled to the remote server.

30. (Amended) The system of claim 16, wherein the request from the local device comprises a request for the remote device to provide a service, and wherein the performing of the further processing includes requesting the remote device to perform the service identified in the service request and the request message.

31. (Amended) A method for a first consumer device to access services of a remote second device, comprising:

establishing a link between the first consumer device and the remote second device that allows the first consumer device to access services from the remote second device, by

establishing a first communicative connection between the first consumer device and a first server that is local to the first consumer device;

establishing a second communicative connection between the first server and a second server that is remote from the first server and local to the second device; and

establishing a third communicative connection between the second server and the second device,

wherein the established link includes the first, second and third communicative connections and wherein communications from the first consumer device to the remote second device are forwarded along the link by the first and second servers in a manner transparent to the first consumer device, the forwarding in the transparent manner such that the first consumer device and the second device appear to each other to be local;

requesting a service that is available from the second device, the requesting by the first consumer device and utilizing the established link; and

performing the requested service at the second device.

32. (Amended) A method for a first consumer device to access services of a remote second device, comprising:

establishing a link between the first consumer device and the remote second device that allows the first consumer device to access services from the remote second device, by

establishing a first communicative connection between the first consumer device and a first server that is local to the first consumer device;

establishing a second communicative connection between the first server and a second server that is remote from the first server and local to the second device; and

establishing a third communicative connection between the second server and the second device,

wherein the established link includes the first, second and third communicative connections and wherein communications from the first consumer device to the remote second device are forwarded along the link by the first and second servers in a manner transparent to the first consumer device, the forwarding in the transparent manner including the first server device representing the second device in communications with the first consumer device over the first communicative connection and including the second server device representing the first device in communications with the second device over the second communicative connection;

requesting a service that is available from the second device, the requesting by the first consumer device and utilizing the established link; and

performing the requested service at the second device.

33. The server device of claim 8 wherein the forwarding of the service request responses to the client device is performed in such a manner as to appear to the client device that the server device performed the requested services.

34. The server device of claim 8 wherein the information sent to the client device includes information about services available from the server device, and wherein the processing unit is further operable to perform service requests received from the client device for one or more of the services available from the server device and generate responses to the client device for at least some of those service requests.

35. The server device of claim 8 wherein the second server device is remote from the server device, wherein the second server device is in communication with a third server device that provides the available services whose information was obtained from the second server device, and wherein the service requests forwarded to the second server device for the available services cause the requested available services to be provided by the third server device.

36. (Amended) A server device that is capable of communicating over a first communications link with a client device and over a second network link with a second server device, comprising:

a communications link interface for communicating between the server device and the client device using SDTP protocol;

a network interface for communicating between the server device and a second server device using HATP protocol; and

a processing unit, being operable to send and receive data over the communications link interface and over the network interface, the processing unit being further operable to:

establish a communications link for data communication through the link interface with the client device;

establish a network link for data communication through the network interface to the second server device;

provide information to the client device about available services by, obtaining information from the second server device about services available via the second server device; and

sending to the client device information about available services that includes the obtained information from the second server device; and

facilitate performance of services for the client device by, forwarding service requests from the client device to the second server device for one or more of the available services whose information was obtained from the second server device and sent to the client device; and

forwarding responses to at least some of the service requests from the second server device to the client device.

37. The server device of claim 8 wherein the client device is able to perform services for other devices, and wherein the processing unit is further operable to:

obtain information from the client device about the services that the client device is able to perform;

send to the second server device the obtained information from the client device; and

facilitate performance of services for the second server device by the client device by forwarding service requests received from the second server device to the client device.

38. (New) A method for a first consumer device to access services of a remote second device, comprising the steps of:

establishing a link between the first consumer device and the remote second device via multiple intermediate servers that allows the first consumer device to access services from the remote second device, by

initiating establishment of a first communicative connection between the first consumer device and a first server that is local to the first consumer device, the first communicative connection using SDTP protocol for communications over the connection; and

initiating establishment of a second communicative connection between the first server and a second server that is remote from the first server and local to the second device, the second communicative connection using HATP protocol for communications over the connection, so that the second server and the second device can communicate using a third communicative connection,

wherein the established link includes the first, second and third communicative connections; and

requesting a service that is available from the second device, the requesting by the first consumer device and utilizing the established link, such that the second device performs the requested service after receiving the request.

39. (New) An apparatus for accessing services of a remote device, comprising:

a first module capable of initiating establishment of a first communicative connection to a local server such that the first connection uses SDTP protocol, of initiating establishment of a second communicative connection between the local server and a remote server proximate to the remote device such that the second connection uses HATP protocol, and of initiating establishment of a third communicative connection between the remote server and the remote device such that the third connection uses SDTP protocol; and

a second module capable of requesting a service from the remote device via the first, second, and third communicative connections, so that the remote device will perform the requested service.

40. (New) A method for a first client device to access the services supplied by a second client device, comprising the steps of:

establishing a first link between the first client device and a first server, wherein communications over the first link use SDTP protocol;

transmitting a connection command over the first link to the first server, the connection command being operative to request a connection with a second server and including an address of the second server, a user identification, and a password;

establishing a second link between the first server and a second server based on the connection command, wherein communications over the second link use HATP protocol;

transmitting the connection command over the second link from the first server to the second server;

verifying the authorization of the user identification and password at the second server;

notifying the first server over the second link from the second server of the acceptance of the connection command upon success of the verifying step;

notifying the first client device from the first server over the first link of the acceptance of the connection command;

requesting a listing from the first server of available services from the second client device wherein the first server requests such a listing from the second server, the second server maintaining such a listing from the second client device which is communicatively coupled to the second server over a third link, the listing identifying at least one service offered by the second client device;

the first consumer device requesting a service from the listing to be performed by the second client device by relaying a service request to the second client device via the first, second and third links; and

performing the service requested in the service request by the second client device.

41. (New) A first client apparatus for accessing services supplied by a second apparatus, comprising:

means for initiating establishment of a first link between the first apparatus and a first server, the first link using SDTP protocol for communications over the first link;

means for transmitting a connection command over the first link to the first server, the connection command being operative to request a connection with a remote second server and including a user identification, and a password;

means for receiving notification from the first server over the first link of acceptance of the connection command by the second server, the receiving of the acceptance notification after a second link is established between the first server and the second server, after the connection command is transmitted over the second link from the first server to the second server, and after the second server verifies authorization of the user identification and password, the second link using HATP protocol for communications over the second link;

means for requesting a listing from the first server of one or more services available from the second apparatus, wherein the second server maintains such a listing based on information obtained from the second apparatus over a third link communicatively coupling the second server to the second apparatus, the third link using SDTP protocol for communications over the third link, and wherein the first server obtains the listing from the second server;

means for receiving from the first server the requested listing; and

means for requesting a service from the listing to be performed by the second apparatus by relaying a service request to the second apparatus via the first server, such that the requested service will be performed by the second apparatus.

42. (New) A system for allowing client devices remote from each other to communicate via intermediate server devices, the system comprising:

a local server able to communicatively couple to a client device that is local to the local server using SDTP protocol, the local client device designed to communicate only with other local client devices, the local server also able to communicatively couple to a remote server using HATP protocol, the local server operative to:

receive a request from the local client device for an indicated service to be performed;

provide a request message to the remote server to perform the indicated service;

receive a response message from the remote server, the response message being affiliated with the request message; and

respond to the local client device with information indicative of the response message; and

the remote server able to communicatively couple to the local server using the HATP protocol and to a remote client device that is local to the remote server using the SDTP protocol, the remote server operative to:

receive the request message from the local server;